Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

A281.9
Ag83E
NO. 611

ERS-611

TRENDS AND PATTERNS IN SOYBEAN OIL USE FOR FOOD AND INDUSTRIAL PRODUCTS

SPEECH BEFORE THE WORLD SOYBEAN RESEARCH CONFERENCE, AT THE UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN, ILLINOIS, AUGUST 4, 1975

By George W. Kromer

ECONOMIC RESEARCH SERVICE

U.S. DEPARTMENT OF AGRICULTURE

Today the soybean is the most important oilseed in world production and trade and the United States has contributed greatly to the attainment of this position.

Similarly, soybean oil is the world's leading vegetable oil and output as well as consumption has moved up sharply over the past decade. Soybean oil accounts for approximately 30 percent of the world's output of vegetable oils and 20 percent of all fats and oils. World requirements for soybean oil have eased some in 1975 due to economic recessionary forces and increased competition from other oils and fats.

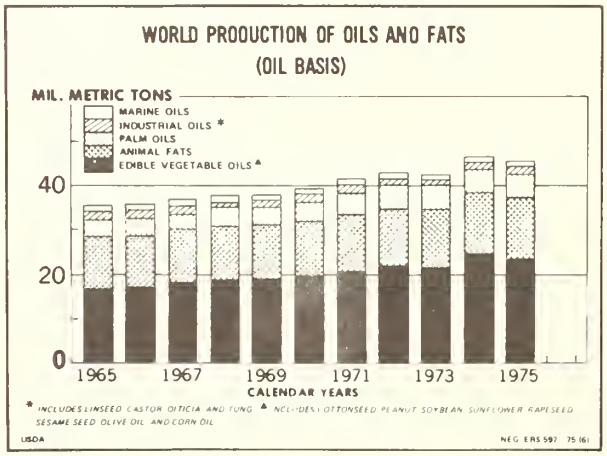
Let's take a brief look at global production of oils and fats.

World Output at Near Record Levels

Over the past decade world production of vegetable, animal, and marine oils and fats has been increasing by about 1 million metric tons annually or 3 percent--from 35 million in 1965 to 46 million this year. Edible vegetable oils comprise over half of this total. If we include palm oils in with edible vegetable oils, then the group represents about two-thirds the total output of oils and fats.

The 1975 world production estimate of 46 million tons is about 2 percent below last year's record level. The decline reflects reduced output of U. S. soybean oil--down by about 1 1/2 million tons--although smaller sunflower oil outturns in East Europe and the USSR also contributed. These declines more than offset increased soybean production in Brazil, palm oil in Malaysia, coconut oil in the Philippines, and peanut (groundnut) oil in Nigeria and Senegal.

The United States typically accounts for about one-fourth of the world's production of oils and fats and one-third of the world exports.



Edible Oils Comprise Two-Thirds World Fat Output

The most dynamic expansion in oils and fats production has occurred in edible vegetable oils (including palms), which rose from about 19 million metric tons in 1964 to 29 million estimated for 1975--a gain of some 50 percent. About 4 million tons or 40 percent of the increase was in soybean oil. Sunflower oil and palm oil output doubled during the period, cottonseed oil increased slightly while peanut oil and coconut oil showed little change.

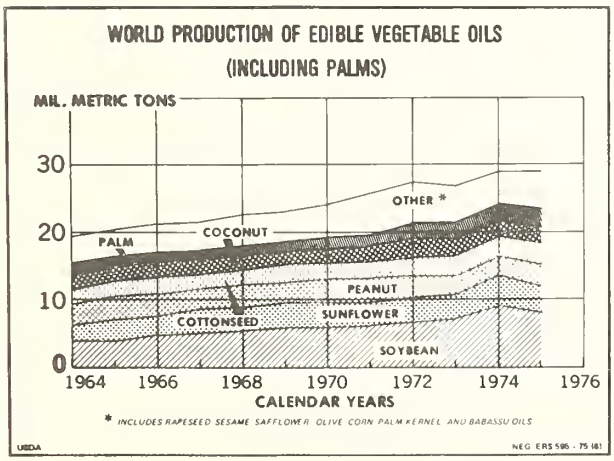
World exports of edible vegetable oils (including palms) rose from 6 million tons in 1964 to an estimated 10 million this year. Soybeans (oil basis) are by far the largest volume oil or fat moving in world trade, accounting for more than a fourth of total world exports in 1975 and two-fifths the edible vegetable oils. Palm oil and rapeseed oil exports have also shown significant increases over the past decade.

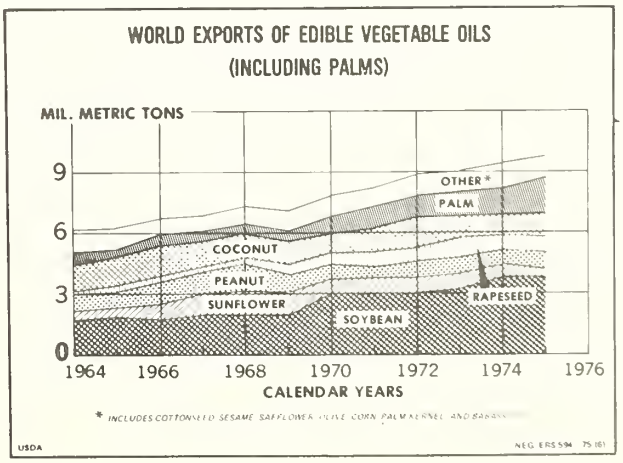
Soybean Production Trends

Now let's take a brief look at world soybean production as this is the raw material from which soybean oil is extracted and the source of high-protein meal.

World production of soybeans has nearly doubled over the past decade, increasing from 32 million metric tons in 1965 to an estimated 61 million in 1975. Production in 1974 dipped to 51 million tons (from 57 million in 1973), reflecting the sharply reduced crop in the United States because of summer drought and premature frosts.

The average annual increase in world soybean production was about 3 million tons during 1965-1975. If we exclude the drought year in the United States (1974) the average annual rate was nearly 4 million tons.





During 1965-1973 the United States accounted for 71 to 76 percent of the world's soybean output, the People's Republic of China (PRC) share dropped from 21 percent to 12 percent while Brazil increased its position from 2 percent to 9 percent. In 1974 Brazil moved ahead of the PRC to become the second largest soybean producer, accounting for 14 percent of the world total. The United States' position fell to 65 percent due to the short crop.

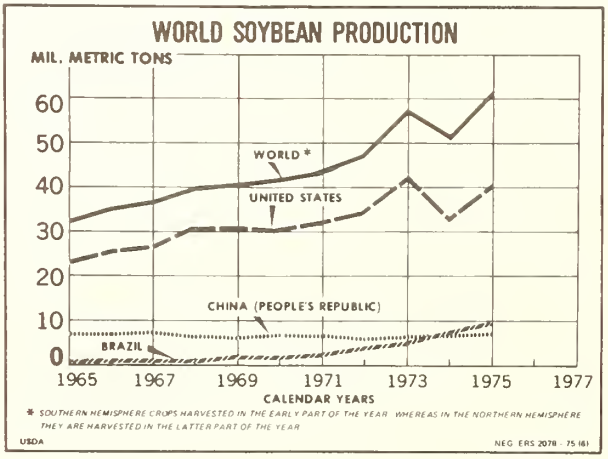
Brazil this year has harvested a record large soybean crop of about 10 million metric tons--an increase of 2 million tons or 30 percent over 1974. In the United States the planted area to soybeans is estimated at 22 million hectares (54.6 million acres), the second largest of record. If growing and harvesting conditions are favorable, we should have a 1975 soybean crop of around 40 million metric tons, compared with 33 1/2 million last year and the record 42 million produced in 1973. USDA's first official estimate of the 1975 soybean crop will be released August 11.

Edible Oil Consumption Varies Widely by Areas

World oil and fat consumption patterns are influenced by indigenous production. Those produced locally are usually favored because of comparative advantage in production, lower transportation costs, consumer habits and preferences, and protective economic policies. In the major importing areas of the world, such as Western Europe and Japan, a wide array of primary oils and fats is available, many of which can be used interchangeably in food fat products. For this reason, consumption in these regions is spread over a wider range of oils and fats than in other countries.

World demand for oils and fats is largely related to population, income, and price. At specified levels of population and price, the rate of growth in income largely determines the level of per capita consumption.

In the developed countries (DC for short) of the world where oil use per head is high, aggregate consumption of vegetable oils generally exceed the production. In 1974 apparent total consumption in DC was 12 million metric tons while



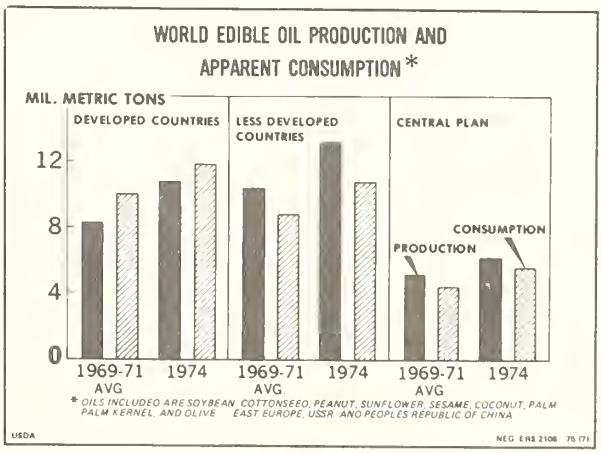
production was 11 million, leaving an import balance of 1 million tons. 1/ Of course within this grouping of countries, the United States and Canada were net exporters of edible oils while Western Europe and Japan were net importers.

In sharp contrast, the less-developed countries (LDC) produce greater quantities of vegetable oils than needed for home consumption as per capita use is relatively low. In 1974 production of edible oils exceeded 13 million tons while local use was about 11 million, leaving an export balance of more than 2 million tons. East Asia (Pacific) is the largest area exporting vegetable oils followed by Central Africa and Brazil.

On the other hand, edible oil production and consumption in the centrally planned countries (CPC) is more evenly balanced. In 1974 estimated production was 6 million tons while apparent consumption was 5.5 million. Within this grouping, the USSR was a net exporter of vegetable oils while the PRC and East Europe were net importers.

In recent years the output of edible oils in LDC has increased at a faster rate than home requirements, thereby making increasingly larger amounts available for export. At the same time, edible oil output in the DC has also increased relative to consumption, resulting in reduced import requirements. This partly explains the apparent buildup in world stocks of oils, fats, and oilseeds that is developing in 1975.

1/"Consumption" in this paper is apparent consumption derived from production plus imports less exports. Stocks data for many countries are incomplete or not available.



Vegetable Oils in the European Community

The apparent consumption of vegetable oils in the European Community (EC-9) totaled a record 4.5 million metric tons in 1972 (the latest data available), representing a 50-percent increase over the 3 million tons consumed in 1960. 2/ Consumption of all oils and fats went from 6 million tons to over 8 million in 1972, a 37-percent rise, or 2 1/2 percent annually.

Usage of soybean oil in 1972 reached 1 million tons, about double the early 1960's level and accounted for a fifth of all vegetable oils in the EC-9.

Per capita consumption of all oils and fats rose from 25.6 kilos (56.5 pounds) in 1960 to 31.8 kilos (70 pounds) in 1972--a 24-percent increase. At the same time, vegetable oil consumption rose 35 percent, moving from 12.8 to 17.4 kilos per person. Although sunflower oil and rapeseed oil showed the largest gains percentage-wise, soybean oil registered the largest growth in terms of volume, expanding about 2 kilos per capita. Soybean oil went from 2 kilos (4.6 pounds) to 4 kilos (8.7 pounds).

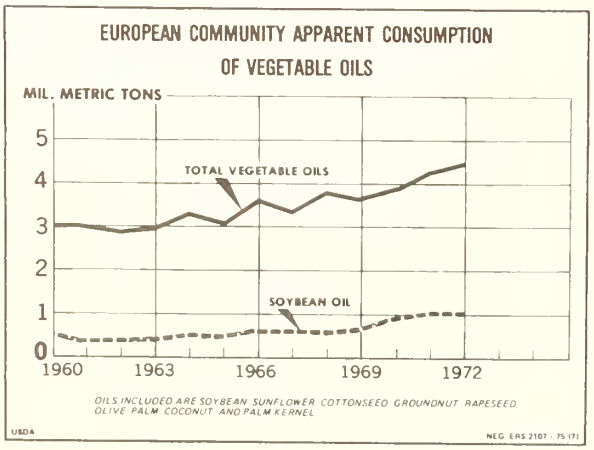
The population of the EC-9 grew a tenth during 1960-1972, while vegetable oil consumption per person rose more than a third. Therefore, the increase in vegetable oil consumption is not only due to a larger population but, as noted, to rising consumption per person. Population growth is likely to be slower in the future and growth in per capita consumption should be lower.

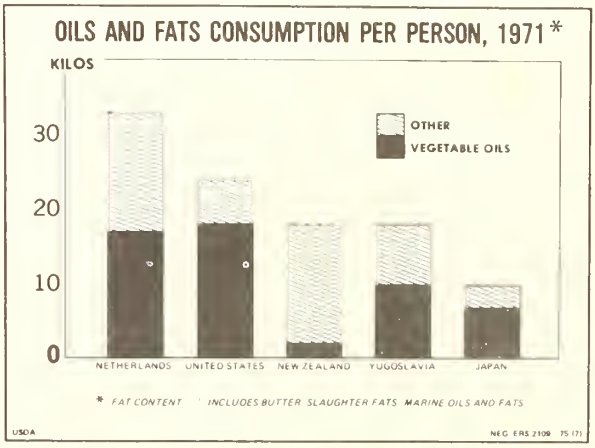
Fat Consumption Shows Sharp Contrast Between Countries

As mentioned earlier, world demand for oils and fats is largely related to world population and growth in income. Local consumption levels may further be

---

2/Countries which compose the European Community are Belgium-Luxembourg, Denmark, France, West Germany, Ireland, Italy, the Netherlands, and the United Kingdom.





influenced by indigenous production, climate, eating habits as well as social circumstances. These factors cause a wide variation in oils and fats consumption in the different areas of the world.

Generally speaking, oil and fat consumption per person is the highest in several West European countries (30 kilos) and the lowest in African (2 kilos) and Asian (5 kilos) countries.

More specifically, during 1971 (latest data available) the consumption of oils and fats in the Netherlands averaged 33 kilos per person (73 pounds), about half of which were vegetable oils. The remainder consisted of slaughter fats, marine oils, and butter.

In the United States consumption was 24 kilos (53 pounds), about three-fourths of which were vegetable oils--mainly soybean oil.

In sharp contrast, consumption in New Zealand during 1971 averaged 18 kilos per person; 16 kilos were in the form of animal fats, mainly butter.

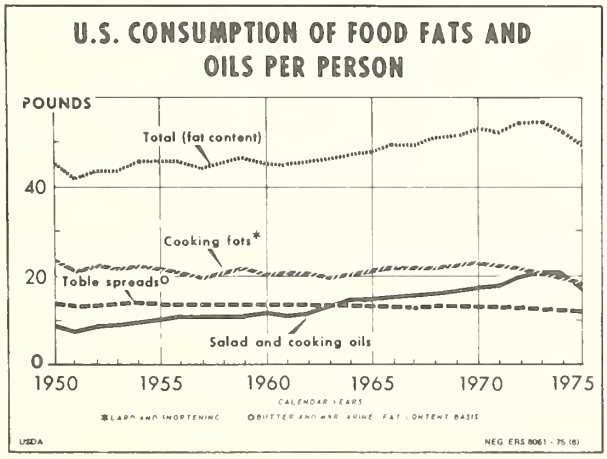
In Japan oils and fats usage was 10 kilos per person during 1971, about three-fourths being in the form of edible vegetable oils. Animal fats accounted mainly for the remainder.

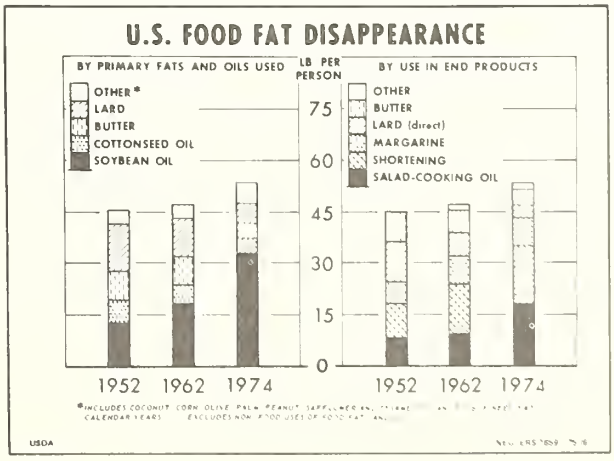
These analyses point up the big potential for expanding oils and fats consumption in areas where usage is very low.

The remainder of this paper will be devoted to the food fats and oils situation in the United States, with special emphasis on soybean oil.

U. S. Food Fat Consumption Trends

U. S. consumption of food fats and oils has increased over the past 20 years or so, with most of the gain occurring since the mid-1960's. During 1955-1965 use remained relatively stable at around 45 pounds (20 kilos) per person. Then consumption started to increase annually reaching over 54 pounds (25 kilos) in 1973.





Food fat usage is off sharply this year, dropping to an estimated 49 pounds, some 5 pounds or a tenth below the 1973 peak. Use of salad and cooking oils is down the most followed by lower use of cooking fats and table spreads. Reduced consumption is due primarily to the recession and its adverse effect upon employment and consumer spending. Also, inflation and high prices for food fats over the past year or so have forced consumers to curtail purchases where possible.

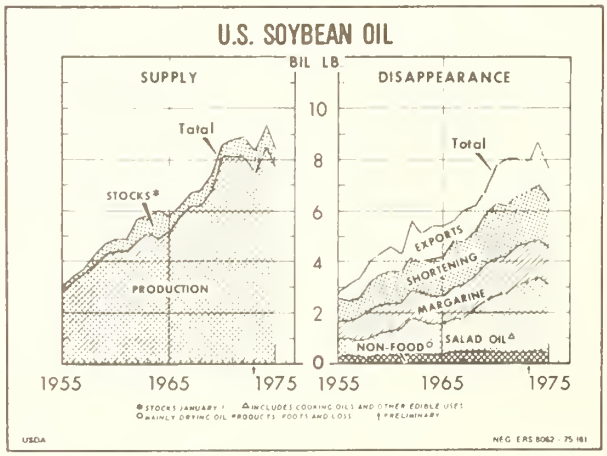
Soybean Oil Dominates Market

Soybean oil has surged ahead to become the leading vegetable oil in the U. S. food fat economy--now accounting for well over half of all fats and oils going into food products. Soybean oil's growth has more than offset the decline in cottonseed oil, once the major edible oil in this country.

Expanding use of soybean oil is mainly responsible for an overall increase in per capita consumption of food fats and oils. The use of soybean oil rose from about 13 pounds per person or nearly 30 percent of all food fats consumed in 1952 to 32 pounds or about 60 percent in 1974--an increase of some 150 percent. The expanded use of soybean oil occurred mainly in salad and cooking oils, shortening, and margarine.

U. S. soybean oil supplies (production plus stocks) rose from 3 billion pounds in 1955 to a record 9 1/2 billion in 1974. In other words, soybean oil supplies last year were more than 300 percent above the mid-1950's. For the reasons discussed earlier, soybean oil supplies in 1975 are off sharply, estimated at 8 1/2 billion pounds or 1 billion less than in 1974.

Total disappearance of soybean oil increased from 3 billion pounds in 1955 to a record 9 billion in 1974. In the past 5 years exports have accounted for 13 to 22 percent of the total--ranging from 1 to 2 billion pounds annually.



Domestic disappearance of soybean oil reached a record 7 billion pounds in 1974. About 6 1/2 billion pounds or 93 percent went into food uses while nonfood outlets utilized 0.5 billion pounds or 7 percent. The major food markets for soybean oil are cooking and salad oils, shortening, margarine, and many other edible uses. Nonfood or industrial uses include paint and varnish, fatty acids, resins and plastics, and other inedible products.

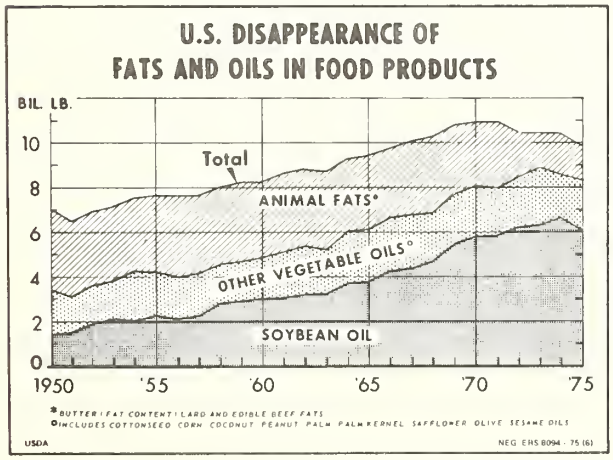
Edible Oil Use Rises; Animal Fats Decline

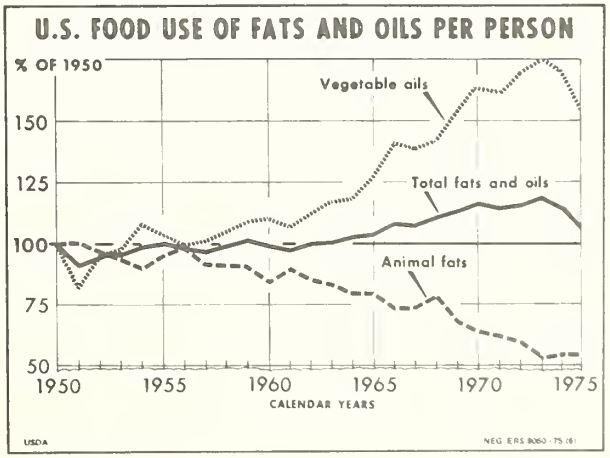
The use of primary fats and oils in food products rose from around 6 1/2 billion pounds in the early 1950's to a record 11 billion in the early 1970's--an increase of some 70 percent. Use has declined slightly recently. Distribution patterns changed significantly among the various types of fats and oils utilized.

In the early 1950's the U. S. food fat market was split approximately equally between animal fats (lard, butter, and edible beef fats) and edible vegetable oils. In 1975, however, edible vegetable oils account for over 80 percent and animal fats less than 20 percent. In terms of use of fats per person, edible vegetable oils this year are 150 percent above the 1950 average whereas animal fats are only 50 percent as high as in that base year.

Soybean oil has prospered, since producers have responded directly to expanding demand for soybean oil and meal. In contrast, cottonseed oil and lard are unresponsive to demand and price changes since they are byproducts of the cotton and hog industries. Butter output is affected by the supply of milk and the use of milk in other dairy products.

Soybean oil's dominance is even more striking when edible vegetable oils are analyzed as a group. During 1950-1974 soybean oil's share gained from about 42 percent to 75 percent of the edible oils. Cottonseed oil fell from 42 percent to 9 percent. Use of corn, coconut, peanut, palm, and other oils trended upward but their shares remained relatively small.





On a per capita basis, edible vegetable oil consumption jumped during the past decade--from 31 pounds in 1964 to a record 42 pounds in 1973--more than a third increase. It was during this past decade when the sharpest increase in food fat usage occurred. Soybean oil climbed from 19 pounds per person to 32 pounds in 1973. Meanwhile, cottonseed oil use fell from 8 pounds to 4 pounds.

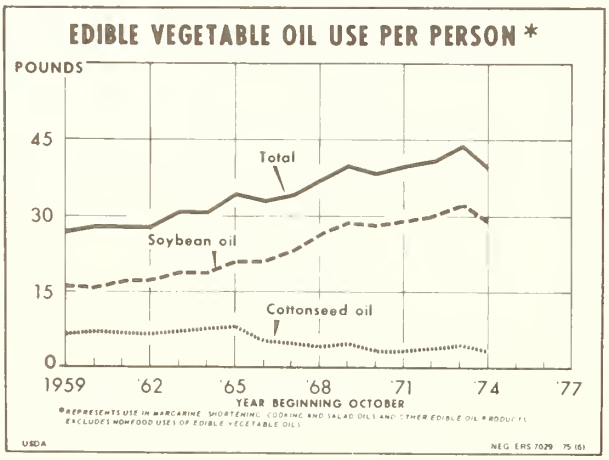
U. S. imports of duty free palm oil from Malaysia and Indonesia are expanding sharply because of its price advantage over soybean oil and cottonseed oil. We are estimating this year's palm oil imports at around 700 million pounds, roughly double the 1974 level. The biggest market for palm oil in the United States is in shortening manufacture but use as a cooking oil and in margarine manufacture is on the increase.

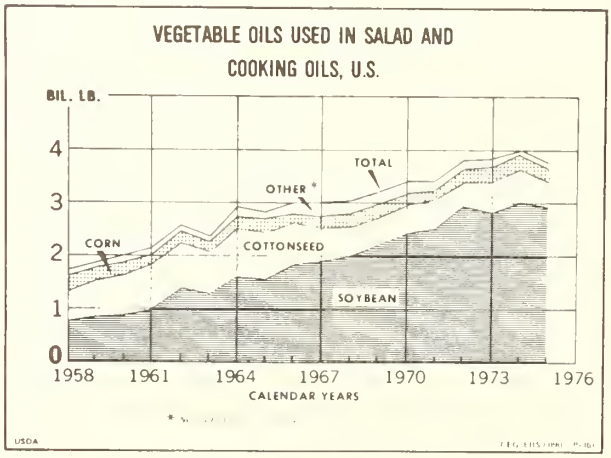
Soybean Oil Use Patterns

The output of salad and cooking oils has shown the sharpest expansion among the food fat products, the volume rising from 1.8 billion pounds in 1958 to over 4 billion last year. Per capita consumption rose from about 8 pounds to 18 1/2 pounds.

Total use of all fats and oils in salad and cooking oils rose from 1.7 billion pounds in 1958 to a record 4 billion in 1974. In the earlier period, soybean oil and cottonseed oil were equally important. Corn oil, peanut oil, safflower oil, and olive oil volumes were relatively small.

The expansion in salad and cooking oil output and soybean oil use in these products have gone hand in hand. This is the largest market outlet for soybean oil and use increased from about 700 million pounds in 1958 (accounting for 40 percent of all fats and oils used) to 3 billion last year (over 75 percent). Cottonseed oil usage slipped from about 700 million pounds (40 percent) to 545 million pounds (13 percent).





U. S. production of shortening (baking or frying fats) has gone up fairly steadily from 1.4 billion pounds in the early 1950's to the peak 3.7 billion achieved in 1972. Use has declined slightly since. In 1972, about 70 percent of the shortenings produced were all vegetable oil and 30 percent all animal fat or blends. Per capita consumption of shortenings rose from 9 pounds in the early 1950's to a record 18 pounds in 1972.

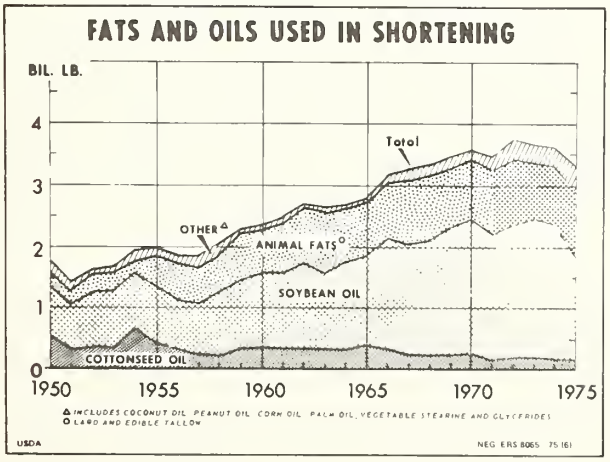
Fats and oils used in shortening rose from 1.4 billion pounds in 1951 to 3.7 billion in 1972. Utilization of soybean oil in shortening manufacture--soybean oil's second largest outlet--increased from 0.7 billion pounds in 1951 (about 50 percent of all fats and oils used) to 2.3 billion in 1973 (60 percent)--a three-fold increase. Cottonseed oil use dropped from 0.6 billion (33 percent) in 1954 to 0.2 billion (5 percent) in the last few years.

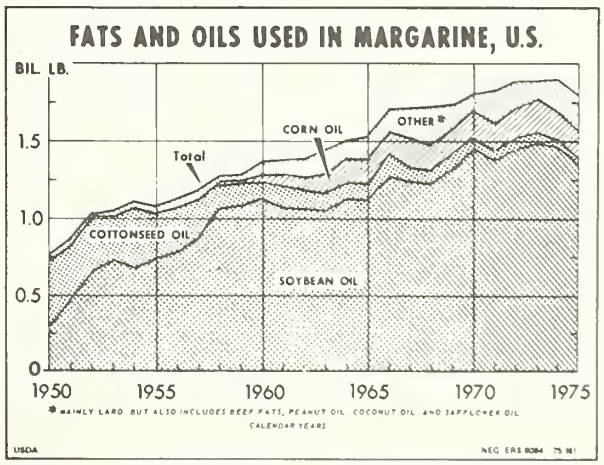
Animal fats (lard and beef fats) used in shortening rose from around 0.3 billion pounds (18 percent of all fats and oils utilized) in the early 1950's to over 1.9 billion (50 percent) in 1972.

Shortening producers shift from one oil or fat to another depending upon price relationships. For example, the use of palm oil in shortening has doubled in recent years because its price has been lower than domestically produced oils and fats.

U. S. consumers have been shifting from butter toward margarine as a table spread for many years. This is attributable mainly to the price difference between the products, improvements in the formulations and qualities of margarine, and the repeal of anti-margarine laws.

Margarine production rose from 0.9 billion pounds in 1950 to about 2.4 billion last year. Increased production and consumption were made possible by the sharp growth in domestic supplies of soybean oil. In recent years there has been an expansion in the use of corn and safflower oils as a margarine ingredient, along with increased production of the soft types. Total margarine consumption rose





from 6 pounds per person in 1950 to 11.3 pounds during 1972-1974. At the same time, butter use fell from 11 pounds to 4 1/2 pounds.

Fats and oils used in margarine trended upward from 0.8 billion pounds in 1950 to 1.9 billion in 1974. Soybean oil use rose from 0.3 billion pounds in 1950 (40 percent of all fats and oils used) to 1.5 billion pounds (79 percent) in 1972-1974. Cottonseed oil use dropped from 0.4 billion pounds (55 percent) in 1950 to less than 0.1 billion pounds last year.

Industrial uses of soybean oil have increased only slightly over the past 2 decades--from 0.3 billion pounds in the mid-1950's to 0.5 billion last year. Consumption in paints and varnishes, resins and plastics declined but this was more than offset by increased utilization in other inedible products, including foots and loss.

• • • •

NATIONAL AGRICULTURAL LIBRARY
1022831411